ZEP Response to the structured public consultation: removal activities under the Article 6.4 mechanism

The Zero Emissions Platform (ZEP) welcomes the opportunity to provide input to the Article 6.4 mechanism Supervisory Body's 'Structured public consultation: removal activities under the Article 6.4 mechanism' and further note our past responses: (i) ZEP Response to the call for input on issues included in the annotated agenda and related annexes of the fifth meeting of the Article 6.4 Supervisory Body (25th May 2023); (ii) Joint CCSA and ZEP response to the Article 6.4 Supervisory Body call for input on carbon removals (15th March 2023).

ZEP is a European Technology and Innovation Platform under the European SET-Plan, acting as the adviser to the European Union on the deployment of carbon capture and storage (CCS) and carbon capture and utilisation (CCU). ZEP is a multi-stakeholder platform, bringing together a broad range of participants, from oil&gas, industry, utilities and equipment suppliers, to academia, trade unions, and environmental NGOs.

ZEP is pleased to contribute to the work of the Supervisory Body and remain available to expand on any element of this response.

Cross-cutting questions

1. Discuss the role of removals activities and this guidance in supporting the aim of balancing emissions with removals through mid-century.

Tackling climate change will require a plethora of approaches. While removals must never be used as a substitute to emissions reductions, the development and deployment of carbon removals is an essential part of that portfolio and is necessary to counterbalance both residual and historical CO_2 emissions. As highlighted by the United Nations Intergovernmental Panel on Climate Change (IPCC)[1], carbon removals are crucial element on the road to net-zero (reducing net emission levels), to enable net-zero (balancing residual emissions) and to achieve and sustain net-negative emissions.

Reaching net-zero by 2050 and net-negative thereafter requires the deployment of large volumes of carbon dioxide removals, to be achieved through the various methods available – both land-based and engineered. The overwhelming proportion of IPCC[2] scenarios compatible with the temperature targets of the Paris Agreement require the deployment of carbon dioxide removals, primarily bioenergy with carbon capture and storage (BECCS) and/or direct air carbon capture and storage (DACCS).

Mechanisms such as the Article 6.4 can support the development of carbon removals at scale, notably, by creating early demand and providing the needed predictability for prospective carbon removal developers and buyers. This guidance is essential to provide clarity and credibility in carbon markets through the development of a well-designed, enabling, and transparent regulatory system, namely monitoring, reporting, verification and governance mechanisms – and can stand in as a gold standard

[1] IPCC (2022). Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge, UK and New York, NY, USA. doi: 10.1017/9781009157926

[2] idem

guidance for carbon markets. It should also be noted that this guidance is being developed alongside other initiatives (e.g., European Union's certification scheme for carbon removal activities[3]) and that consistency in carbon removal accounting is essential to build trust in carbon markets, establish a global level-playing field and unlock further opportunities for developers.

3. How are these elements understood, in particular, any interrelationships in their functions, timeframes, and implementation? (a) Monitoring period (b) Crediting period (c) Timeframe for addressing reversals

Monitoring, reporting and verification mechanisms must take into account the characteristics of the different types of carbon removal methods as they vary greatly in terms of the storage timescales that can be achieved and in the reversal risks involved. These differences will result in different requirements for (i) monitoring periods, (ii) crediting periods and (iii) managing reversals:

- Crediting periods should be aligned with the achievable storage timeframe. Longer crediting periods should be assigned to activities that achieve permanent storage, recognising the long-term climate value of geological storage methods, capable of storing CO2 for thousands of years.
- Monitoring periods must be in line with storage timescales and reversal risks. As general principle, the monitoring period should be at least as long at the crediting period (in the case of geological storage, monitoring continues after the end of injection). Monitoring requirements must be defined accordingly, taking into account the potential for reversal through time.

Questions on specific elements
A. Definitions:

Discuss the role and potential elements of definitions for this guidance, including "Removals".

It is important to clearly define "removals", avoiding misconceptions and confusion with carbon dioxide reductions. A robust and thorough definition must reflect the following principles[4,5]:

1. CO_2 is physically removed from the atmosphere.
2. The removed CO_2 is stored out of the atmosphere in a manner intended to be permanent.
3. Upstream and downstream greenhouse gas emissions, associated with the removal and storage process, are comprehensively estimated and included in the emission balance.
4. The total quantity of atmospheric CO_2 removed and permanently stored is greater than the total quantity of CO_2 emitted to the atmosphere.

The concept of "permanence" should also be accurately defined in the proposed guidance. While different activities can achieve carbon dioxide removal, they will involve different storage timeframes

[3] European Commission Proposal for a Regulation of the European Parliament and of the Council establishing a Union certification framework for carbon removals.
[4] Adapted from Tanzer, S. E., & Ramirez, A. (2019). When are negative emissions negative emissions?. Energy & Environmental Science, 12(4), 1210-1218.
[5] See also: ZEP (2020). Europe needs a definition of Carbon Dioxide Removal.

and risks of storage reversal. For example, storage in products and carbon farming activities will typically store CO_2 out of the atmosphere for decades to centuries; while storage of CO_2 in geological reservoirs offers the opportunity to safely store CO_2 for thousands of years. The European Commission proposal for a Regulation establishing a Union certification framework for carbon removals defines "permanent carbon storage" as "a carbon removal activity that, under normal circumstances and using appropriate management practices, stores atmospheric or biogenic carbon for several centuries, including bioenergy with carbon capture and storage and direct air carbon capture and storage".

B. Monitoring and Reporting:

1. What timeframes and related procedures should be specified for these elements referred to in A6.4-SB003-A03?

(a) For initial monitoring and submission of monitoring reports (paragraph 3.2.14);

(b) For subsequent monitoring and submission of monitoring reports (paragraph 3.2.14);

(c) For monitoring and submission of monitoring reports following an observed event that could potentially lead to a reversal (paragraph 3.2.14);

(d) For monitoring and reporting, including any simplified reporting, conducted after the end of the last crediting period of activities involving removals (paragraphs 3.1.10 and 3.2.13).

ZEP notes that many elements related to monitoring, reporting and verification (MRV) for the geological storage of CO_2 have been laid out in national and regional regulations. It is important that the monitoring and reporting timeframes in the proposed guidance are developed in a manner that is consistent with MRV requirements for geological storage set out in those regulations which can be considered good/best practice. This is aimed at ensuring that a mismatch between the timeframes required by national competent authorities and the ones set by international frameworks. A mismatch could be particularly challenging as, in most circumstances, the final 'mixture' of CO_2 in storage reservoirs will comprise many sources of CO_2, potentially under different crediting frameworks. Moreover, alignment with those frameworks that already in place will allow for faster implementation and a lesser burden on developers.

The storage of CO_2 in geological reservoirs is regulated by the CO_2 Storage Directive (CCS Directive[6]) in European Union Member States, Iceland, Norway and Liechtenstein (European Economic Area, EEA), and by the 2010 CO2 Storage Regulations in the UK[7], which establish a legal framework for the safe geological storage of CO_2. Both storage legal frameworks include provisions for site selection and characterisation which are designed to minimise the risk of leakage, conditions for permitting, as well as monitoring and reporting requirements to verify storage, including remediation obligations in case of reversals.

[6] Directive 2009/31/EC of the European Parliament and of the Council of 23 April 2009 on the geological storage of carbon dioxide and amending Council Directive 85/337/EEC, European Parliament and Council Directives 2000/60/EC, 2001/80/EC, 2004/35/EC, 2006/12/EC, 2008/1/EC and Regulation (EC) No 1013/2006.
[7] The Storage of Carbon Dioxide (Licensing etc.) Regulations 2010.

Both frameworks require operators to carry out monitoring based on an approved monitoring plan which is updated every 5 years "to take account of changes to the assessed risk of leakage, changes to the assessed risks to the environment and human health, new scientific knowledge, and improvements in best available technology". Operators are also required to report to competent authorities at least once a year.

The frameworks also specify a minimum period of 20 years before all legal obligations relating to monitoring and corrective measures can be transferred to competent authorities. Notably, a degree of flexibility is maintained in those frameworks – i.e., a shorter transfer period can be agreed if evidence suggest that the stored CO_2 will be completely and permanently contained before the end of that period. This relatively short period (compared to the timeframe of millennia that geological storage can achieve) is made possible by a decreasing risk of reversal observed for geological storage, with sufficient scientific evidence for competent authorities to feel comfortable to take on the responsibilities.

ZEP considers that the development of MRV timeframes and procedures for the purposes of the Article 6.4 mechanism can benefit from building on the provisions laid out in the EU/EEA and UK CO2 storage legal frameworks.

2. Discuss any further considerations to be given to the core elements for monitoring and reporting in A6.4-SB003-A03; where possible, identifying the applicable scope, i.e., relevance to all 6.4 mechanism activities, to removals activities, or to specific removal activity categories or types.

Further elements for consideration: (i) alignment with existent good/best practice regulatory frameworks that can be considered good/best practice, also taking into account that a degree of flexibility must be preserved (*see response to question 1 above*); (ii) setting out robust MRV requirements for geological storage and other storage methods must be equally robust and confer an equivalent level of confidence that carbon dioxide continues to be stored out of the atmosphere.

Accounting for removals:

1. Discuss any further considerations to be given to the core elements for accounting for removals in A6.4-SB003-A03; where possible, identifying their applicable scope, i.e., relevance to all 6.4 mechanism activities, to removals activities, or to specific removal activity categories or types.

Further element for consideration:

Complete carbon accounting: the quantification of carbon removals must be robust, transparent, and complete. In this sense, a cautious and comprehensive verification of principle 3 (*see above, in the definition for "removals"*) is critical to make sure that all associated emissions are included in the life-cycle analysis (including energy/electricity input and activity taking place after the end of the life of the products).This also implies that while some technologies have the potential to lead to carbon removals, a case-by-case approach is needed to ensure that projects deliver real 'net' carbon removals. Importantly, this requires ER certificates to be issued on a net removal basis.

D. Crediting period:

Discuss any further considerations to be given to the core elements for crediting periods in A6.4-SB003-A03; where possible, identifying the applicable scope, i.e., relevance to all 6.4 mechanism activities, to removals activities, or to specific removal activity categories or types.

See response to question 3 (cross-cutting questions) above.

E. Addressing Reversals:

In order to minimize the risk of non-permanence of removals over multiple NDC implementation periods, and, where reversals occur, ensure that these are addressed in full.

1. Discuss the applicability and implementation aspects of these approaches, including as stand-alone measures or in combination, and any interactions with other elements of this guidance:

a. Non-permanence risk buffer (pooled or activity-specific);

b. Insurance / guarantees for replacement of ERs where reversals occur (commercial, sovereign, other);

c. Other measures for addressing reversals in full.

ZEP encourages the Supervisory Body to consider existent national and regional regulations when defining the approaches to minimise non-permanence risks. Notably, the CO_2 storage legal frameworks mentioned above require operators to have an approved corrective measures plan which must be implemented in case of leakages. Furthermore, operators are required to surrender emission allowances equivalent to leaked emissions.

In this context, risk buffers and insurance/guarantees could result in extra obligations on EEA and UK storage operators, as well as have potentially significant implications on revenue streams. It would thus be sensible to consider existent legal frameworks so as to avoid conflicts with existent legislation while keeping the essence of the requirements. Furthermore, liability frameworks for other types of carbon removal activities must be as robust as the ones in place for geological storage.

2. Discuss the appropriate timeframe(s) for applying the approaches, including any interactions with other elements of this guidance and the applicable scope, i.e., relevance to all 6.4 mechanism activities, to removals activities, or to specific removal activity categories or types.

Once again, ZEP would encourage the Supervisory Body to consider existent national and regional regulations when defining these approaches. For example, under the EEA and UK regulatory frameworks mentioned, operators remain liable for leakages and must apply the necessary corrective measure (as set out in the corrective measures plans and by surrendering emission allowances equivalent to any leaked emissions) for the minimum period of 20 years. After this period, responsibilities relating to monitoring and corrective measures are transferred to national competent authorities.

4. In respect of risk assessment, how should the following elements be considered in the implementation of the approaches in (a) and any other relevant elements in this guidance?

a. Level of non-permanence risk assessment, e.g., activity- or mechanism-level

b. Timing for risk assessment(s)

c. Entity(ies) responsible for risk assessment(s), e.g., activity proponent, 6.4SB, actuary

The level of non-permanence risk assessment should be activity-specific, as different activities will have different reversal risk profiles and require different monitoring tools.

The identification of risks should take place prior to certification/accreditation and be updated regularly (see section B.1 above).

Activity proponents should be responsible for risk assessment, subject to the approval of competent authorities.

6. In the event of a reversal, what interactions and implementation aspects should be considered in respect of other elements of the activity cycle?

In the event of reversal, ER credits must be cancelled, up to the amount of the net reversal, and the necessary adjustments must be made in national registries.

F. Avoidance of Leakage:

Discuss any further considerations to be given to the core elements for leakage avoidance in A6.4-SB003-A03; where possible, identifying the applicable scope, i.e., relevance to all 6.4 mechanism activities, to removals activities, or to specific removal activity categories or types.

See section E above. Furthermore, it is essential that the mechanism establishes an appropriate allocation of liabilities for all types of carbon removal activities.

About the Zero Emissions Platform

ZEP is the advisor to the EU on the deployment of CCS and CCU – a European Technology and Innovation Platform (ETIP) under the European Commission's Strategic Energy Technologies Plan (SET-Plan).

ZEP supports the European Union's commitment to reach climate neutrality by 2050, defined as net-zero greenhouse gas (GHG) emissions by 2050. To this end, CCS technologies represent readily available and cost-efficient pathways for the decarbonisation of industrial and energy sectors in the European Union. Some applications of CCU – where CO_2 is stored in a manner intended to be permanent – can also contribute to this goal.